ABSTRACT

A mixed potential electrochemical sensor for the detection of gases has a ceria-based electrolyte with a surface for exposing to the gases to be detected, and with a reference wire electrode and a sensing wire electrode extending through the surface and fixed within the electrolyte as the electrolyte is compressed and sintered. The electrochemical sensor is formed by placing a wire reference electrode and a wire sensing electrode in a die, where each electrode has a first compressed planar section and a second section depending from the first section with the second section of each electrode extending axially within the die. The die is filled with an oxide-electrolyte powder and the powder is pressed within the die with the wire electrodes. The wire-electrodes and the pressed oxide-electrolyte powder are sintered to form a ceramic electrolyte base with a reference wire electrode and a sensing wire electrode depending therefrom.